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Remarks/Arguments

Applicants gratefully acknowledge the withdrawal of the rejection(s) over Fukutani and Mondshine. Applicants have carefully considered the rejection in the final action and submit the foregoing amendments and the following response. The amendments add no new matter. The application is believed to be in condition for allowance in light of the amendments and the following remarks.

Rejection under 35 U.S.C. §103 over Clark alone or in combination with Chesser

The examiner maintained the rejection of claims 127-190 under 35 U.S.C. §103(a) as unpatentable over Clark et al (5,658,860) alone, or in combination with Chesser et al (6,403,537). According to the examiner, Clark discloses a well fluid emulsion having a water phase and an oil phase of a sulfurized alcohol and a naturally occurring fat, oil, or derivatives thereof. The examiner contends that the fatty acids described in Clark have a chain length of 8-30 carbon atoms, and that derivatives of the fatty acids may be used including alkali metal derivatives. The examiner contends that the drilling fluid of Clark "clearly meets the limitations of most of the above rejected claims." Final action, p. 2. The examiner admits that "Applicants' invention differs in some independent and dependent claims by adding one or more monomers comprising acrylamide. However, the examiner contends that Chesser teaches that drilling fluid systems "conventionally contain acrylamide monomers." The examiner concludes that it would have been obvious to add the acrylamide monomers of Chesser to the drilling fluids of Clark if the known imparted properties were so desired. The examiner contends that it is *prima facie* obvious to combine two compositions each of which is taught by the prior art to be useful for the same purpose, here as drilling fluids, in order to form a third composition to be used for the very same purpose, citing *In re Kerkhoven*, 205 USPQ 1069, 1072 (CCPA 1980).

Response

The claims have been amended to clarify that the method provides a drilling fluid system comprising a continuous phase comprising as an integral component a dispersion comprising a quantity of *insoluble fatty acid soap particles*. The amendment adds no new matter. The

amendment also does not narrow the claims, but merely makes explicit subject matter that was already intended by the word "dispersion" as used in the claims.

Persons of ordinary skill in the art would recognize that the claimed fatty acid soaps are particulates. See definition of lithium stearate: "Properties: White crystals, D 1.025, mp 220°C. Insoluble in cold and hot water, alcohol and ethyl acetate; forms gels and mineral oils." Hawley's Condensed Chemical Dictionary (14th Ed. 2001), p. 678.¹ The specification clearly states that:

In order for the lubricant to function effectively in a wide variety of drilling fluid systems, the fatty acid soap preferably is maintained in a wide variety of continuous phases as a "dispersion." Additives or conditions which cause flocculation, coalescence, or otherwise destroy the stable dispersion of the fatty acid soap in the continuous phase are avoided.

Specification, ¶[0014]. The specification further explains that:

In order to ensure that the fatty acid soap remains as a dispersion, the fatty acid soap preferably is **insoluble** in the base fluid of the fluid system being treated. Such base fluids typically comprise oil, water, and solutions comprising oil and/or water base, including but not necessarily limited to brines. Preferred fluid systems are water-based fluid systems. Preferably, the soap dispersion formed in the fluid has thermal stability at temperatures of 250 °F or more. More preferably, when added to the fluid system, the soap dispersion has thermal stability at temperatures of about 300 °F or more, even more preferably at temperatures of about 450 °F or more.

Specification, ¶[0015] (emphasis added).

-In re Kerkhoven is factually distinguishable

The *Kerkhoven* case cited by the examiner is factually distinguishable from the present case. *Id.* In *Kerkhoven*, the CCPA found that the appealed claims were *prima facie* obvious because the claims required no more than the mixing together of two conventional spray-dried detergents, each of which was taught by the prior art to be useful for the *same purpose*, and the final mixture also was to be used for the *same purpose*. *Id.*

¹ See also the definition for potassium stearate: "[w]hite, crystalline powder; slight odor of fat. Mw: 322.57. Soluble in hot water and alcohol." Hawley's Condensed Chemical Dictionary (14th Ed. 2001), p. 919.

The examiner has not established that *insoluble low valence fatty acid soap particles* were known to be useful in drilling fluid systems for any particular purpose. The examiner certainly has not established that insoluble low valence fatty acid soap particles were known to be useful *as corrosion reducing agents* in drilling fluid systems.

The examiner has not pointed to a teaching or suggestion in any cited reference or elsewhere to provide a continuous phase of a drilling fluid system with a dispersion comprising a quantity of *insoluble fatty acid soap particles*.² Clark's listing of fatty acid derivatives as suitable for use *as the internal "oil phase"* of Clark's oil-in-water emulsion do not provide such a teaching. Clark, col. 4, ll. 45-47 (emphasis added). The examiner simply has not pointed to a teaching or suggestion in Clark or elsewhere to maintain the "alkali, alkaline earth, or transition metal substituted fatty acid" as an insoluble fatty acid soap particle in Clark's oil phase.

The examiner has not pointed to any teaching or suggestion that a dispersion of the claimed insoluble low valence fatty acid soap particles would remain thermally stable at increased temperatures of 250 °F (121 °C), 300 °F (148 °C), or even 450 °F (232 °C) (claims 128-130, 142-144, 163-165, and 173-176). Claims 128-130, 142-144, 163-165, and 173-176. The examiner also has not pointed to a teaching in the cited references or elsewhere that the claimed insoluble low valence fatty acid soap particles would *react with* metal surfaces under appropriate conditions. The examiner has not pointed to a teaching or suggestion in any cited reference or elsewhere that the insoluble low valence fatty acid soap particles would coat metal surfaces, "bluing" the metal surfaces, and reducing corrosion of the metal surfaces.

In this regard, Applicant directs the examiner's attention to Example 1 in the specification, the section entitled "Lubricant coating, scanning electron microscopy (SEM)," which reads as follows:

² The examiner certainly has not pointed a teaching or suggestion of such insoluble fatty acid soap particles comprising alkali metal selected from the group consisting of lithium, potassium, rubidium, cesium, and combinations thereof. Independent claims 127, 141, 160. The examiner has not pointed to a teaching or suggestion of selecting lithium as the alkali metal in such insoluble fatty acid soap particles. Claims 138, 150, 152. Nor has the examiner pointed to a teaching or suggestion of a drilling fluid system comprising a continuous phase comprising quantity of *insoluble lithium stearate particles*. Claim 171.

Nails were placed into the base mud and lubricant-treated mud sample prior to aging to evaluate the coating effects (sometimes called "bluing") of the test lubricant. The initial visual analysis revealed the nails that were aged in the lubricant-conditioned fluid to have a coating that the nails in the base fluid did not. These nails were viewed by scanning electron microscopy (SEM) which revealed that the nails exposed to the lubricant-conditioned fluid to have a significantly smoother surface than the nails in the unconditioned sample. Figs. 1a-1d are SEM micrographs of the nails at 20X and 2000X. Figs. 1a and 1b are SEM micrographs of the surface of nails exposed to the base fluid. Figs. 1c and 1d are SEM micrographs of the surface of nails exposed to the lubricant-treated mud. **This evaluation confirmed that the lubricant was providing a physical coating on exposed metal.**

Specification, ¶ [0035] (emphasis added).

Applicant further directs the examiner's attention to Example 2, the section entitled "Lubricant Evaluation Photographs of lubricant coating," which reads:

Nails and corrosion coupons were placed into the base mud and lubricant-treated mud samples prior to aging to evaluate the coating, *i.e.* "bluing," of the test lubricant on exposed metal. The visual analysis after aging revealed that the nails and coupons that were aged in the lubricant-conditioned fluid had a coating while the nails and coupons in the base fluid did not have a coating. **The treated nails and coupons were exposed to the atmosphere for approximately seven (7) months prior to taking the photographs in Figure 2a. The photographs display the protective coating and also there is little or no rust on the coupons and nails on samples exposed to lubricant-treated mud but a significant amount of rust formed on the samples exposed to the untreated base mud.**

Specification, ¶ [0037] (emphasis added). The examiner certainly has not pointed to a teaching or suggestion in the cited references or elsewhere that the claimed insoluble low valence fatty acid soap particles would form a physical coating that could **reduce corrosion of the metal surfaces for up to seven months after exposure to the atmosphere.**

The examiner also has not established that the insoluble low valence fatty acid soap particles would not react with polymers in the drilling fluid system and have an adverse impact on drilling fluid properties. As explained in the specification,

Previous lubricants, sometimes called boundary lubrication additives, generally used fatty acid soaps of metals having a relatively high valence, such as aluminum. Most current drilling fluid systems comprise polymeric materials which tend to react with metals having valences greater than 1. The reaction between the polymeric material and a high valence metal in a fatty acid soap adversely affects drilling fluid properties.

Specification, ¶ [0010].

The examiner simply has not pointed to a teaching or suggestion that the dispersion of insoluble low valence fatty acid soap particles would not react with the polymeric materials comprising acrylamide monomer specified by certain of the claims. Claims 155-159, 169-170, and 182-190. The examiner has not pointed to any teaching or suggestion that a dispersion of the claimed insoluble low valence fatty acid soap particles would remain thermally stable and would not react with the polymeric materials, even at increased temperatures of 250 °F (121 °C), 300 °F (148 °C), or even 450 °F (232 °C). Claims 128-130, 142-144, 163-165, and 173-176.

In order to establish that a claim is obvious, the examiner must establish that the claims are directed merely to “the *predictable* use of prior art elements according to their *established functions*.” *KSR Int’l Co. v. Teleflex Inc.*, 550 U.S. ___, 127 S.Ct. 1727, 82 U.S.P.Q.2d 1385, 1396 (U.S. 2007) (emphasis added). In assessing obviousness, the Federal Circuit recently reaffirmed that “a flexible [teaching-suggestion-motivation (TSM)] test remains the primary guarantor against a non-statutory hindsight analysis.” *Ortho-McNeil Pharmaceutical, Inc. v. Mylan Laboratories, Inc.*, et al., slip. op. 2007-1223, p. 11 (Fed. Cir. March 31, 2008), citing *In re Translogic Tech., Inc.*, 504 F.3d 1249, 1257 (Fed. Cir. 2007).³

The examiner has not met her burden to meet the flexible TSM test. *Ortho-McNeil Pharmaceutical, Inc. v. Mylan Laboratories, Inc.*, et al., slip. op. 2007-1223 at p. 11. The examiner has not established that the claims are directed merely to “the *predictable* use of prior art elements according to their *established functions*.” *KSR Int’l Co. v. Teleflex Inc.*, 82 U.S.P.Q.2d at 1396 (emphasis added). Nor has the examiner established an *apparent* reason to combine known elements in the fashion claimed. *Id.* (emphasis added).

³ The court explained that:

The TSM test, flexibly applied, merely assures that the obviousness test proceeds on the basis of evidence – teachings, suggestions (a tellingly broad term), or motivations (an equally broad term) – that arise before the time of invention as the statute requires. As *KSR* requires, those teachings, suggestions, or motivations need not always be written references but may be found within the knowledge and creativity of ordinarily skilled artisans.

Id. at 11.

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Applicant respectfully requests that the rejection over Clark, alone, or over Clark in view of Chesser be withdrawn.

CONCLUSION

For all of the foregoing reasons, Appellant respectfully requests reconsideration and/or consideration and allowance of all of the pending claims.

Request for Interview

If the examiner disagrees that the claims are in condition for allowance, Applicant respectfully requests that the examiner telephone the undersigned attorney to schedule an interview before issuance of another office action in the case.

The Commissioner is hereby authorized to charge any fees in connection with this paper, or to credit any overpayment, to Deposit Account No. 02-0429 (154-28553), maintained by Baker Hughes Incorporated

Respectfully submitted,



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ATTORNEY FOR APPLICANTS

Hawley's
**Condensed Chemical
Dictionary**
Fourteenth Edition

Revised by
Richard J. Lewis, Sr.



JOHN WILEY & SONS, INC.

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LITHIUM STEARATE

678

lithium stearate. (lithium octadecanoate; octadecanoic acid, lithium salt).

CAS: 4485-12-5. $\text{LiC}_{17}\text{H}_{33}\text{O}_2$.

Properties: White crystals. D 1.025, mp 220C. Insoluble in cold and hot water, alcohol and ethyl acetate; forms gels and mineral oils.

Derivation: Reaction of stearic acid with lithium carbonate.

Grade: Grease, cosmetic.

Hazard: Low toxicity by ingestion. TLV: TWA 10 mg/m³, total dust. Warning: This substance is spontaneously combustible.

Use: Cosmetics, plastics, waxes, greases, lubricant in powder metallurgy, corrosive inhibitor in petroleum, flattening agent in varnishes and lacquers, high-temperature lubricant.

lithium sulfate.

CAS: 10377-48-7. $\text{Li}_2\text{SO}_4 \cdot \text{H}_2\text{O}$.

Properties: Colorless crystals. D 2.06, mp 130C. Soluble in water; insoluble in 80% alcohol. Does not form alums.

Derivation: Reaction of sulfuric acid with lithium carbonate or with spodumene ore.

Grade: Technical and pharmaceutical.

Use: Pharmaceutical products, ceramics.

lithium tetraborate. $\text{Li}_2\text{B}_4\text{O}_7 \cdot 5\text{H}_2\text{O}$.

Properties: White, crystalline powder. Mp loses water at 200C. Very soluble in water; insoluble in alcohol.

Derivation: Reaction of boric acid with lithium carbonate.

Use: Ceramics, vacuum spectroscopy, metal refining and degassing.

lithium titanate. Li_2TiO_3 .

Properties: White powder. Insoluble in water. Has strong fluxing properties in small percentage in titanium-bearing enamels. The insolubility permits its use in vitreous and semivitreous glazes.

lithium tri-tert-butoxyaluminumhydride.

See lithium aluminum tri-tert-butoxyhydride.

lithium tungstate. Li_2WO_6 .

Properties: White crystals. D 3.71. Soluble in water.

lithium vanadate. (lithium metavanadate).

$\text{LiVO}_3 \cdot 2\text{H}_2\text{O}$.

Properties: Yellowish powder. Soluble in water.

lithium zirconate. Li_2ZrO_3 .

Properties: White powder. Insoluble in water. Efficient flux in glasses containing zirconium dioxide. Recommended as a flux in zirconium-opacified enamels, glazes, and porcelains.

lithium-zirconium silicate. $\text{Li}_2\text{O} \cdot \text{ZrO}_2 \cdot \text{SiO}_2$.

Properties: White powder. A strong flux in enamels, glazes, and porcelains. It can be used in place of lithium zirconate.

lithocholic acid.

CAS: 434-13-9. $\text{C}_{27}\text{H}_{46}\text{O}_2$. A bile acid.

Properties: Crystals in leaflets from alcohol. Mp 184-189C. Not precipitated by digitonin. Freely soluble in hot alcohol; soluble in ethyl acetate; slightly soluble in glacial acetic acid; insoluble in water, ligroin.

Derivation: From bile and gallstones, from deoxycholic acid or cholic acid.

Use: Biochemical research.

"Lithol" Red [BASF]. TM for one of a group of pigments made by combining Tobias acid and β -naphthol.

Properties: Poor resistance to sunlight and weathering, generally good resistance to bleeding and to chemicals.

Available forms: Sodium, barium, and calcium lithols.

Use: Industrial enamels, toys and dipping enamels, rubber, plastics, etc.

"Lithol" Rubine [BASF].

$\text{OOCCH}_2\text{H}_4(\text{OH})\text{N} \cdot \text{NC}_6\text{H}_4(\text{CH}_3)\text{SO}_2\text{OCa}$. TM for the calcium salt of an azo pigment made by diazotizing *p*-toluidine-*m*-sulfonic acid and coupling with 3-hydroxy-2-naphthoic acid. Has poor hiding power, good resistance to bleeding and baking, fair lightfastness and alkali resistance.

Use: Paints, plastics, printing inks, cosmetics.

lithopone.

CAS: 1345-05-7. A white pigment consisting of zinc sulfide, barium sulfate, and zinc oxide; formerly used widely in paints, white rubber goods, paper, white leather etc. It has been largely replaced by titanium dioxide.

"Lith-X" [Ansul]. TM for a graphite-base, dry chemical extinguishing agent suitable for fires of lithium, titanium, and zirconium.

litmus. (lichen blue).

Properties: A blue, amorphous powder frequently compressed into small cakes or strips ("paper"). Soluble in water; changes color with acidity of solution, red at pH 4.5, blue at pH 8.3.

Derivation: By treating lichens (particularly *Varicaria lecanora* and *V. roccella*) with ammonia and potash and then fermenting the mass.

Use: Indicator in analytical chemistry where precision is not required, soil testing.

Little, Arthur D. (1863-1935). Born in Boston, Little was a pioneer in the field of industrial research and chemical consulting. Originally an authority on paper technology, he established a consulting industrial chemical laboratory in 1886, which has since become a large institution of worldwide reputation, located in Cambridge, MA. It has

Soluble in water at high insoluble in alcohol. (Sol. range 29-48 degrees. elt of potassium carbon-

glass and refractory maph-temperature mortars, electrodes, detergents,

See potassium

onate. See sodium

cyanide.

over 99% pure. Mp (de-ic and stable. Easily solu-

anides.
photography.

phate. See sodium-

rate. (Rochelle salt; e).
 $O_6 \cdot 4H_2O$. It is salt of L(+)-

sparent, efflorescent crys-ol, saline taste. Unstable 10-80C. Soluble in water, water of crystallization at

id tartrate is dissolved in ed with sodium carbonate, cation, and crystallized. gent, commercial crystals

dicine (cathartic), compo-on, silvering mirrors.

potassium-2,4-hexadie-

:CHCH:CHCOOK.
r. Mp 270C (decomposes), le in water (25C).

servative in meats, sausage

$O_3 \cdot 3H_2O$.
-tan crystals. D 3.197. Sol-; in alcohol.

[LV: 2 mg(Sn)/m².
printing), alkaline tin-plat-

potassium stearate. (stearic acid potassium salt).

CAS: 593-29-3. $C_{17}H_{35}COOK$.

Properties: White, crystalline powder; slight odor of fat. Mw 322.57. Soluble in hot water and alcohol. Grade: Commercial, contains considerable palmitate; FCC.

Use: Anticaking agent, binder, emulsifier, stabilizer for chewing gum, base for textile softeners.

potassium strontium chlorate. See strontium potassium chlorate.

potassium styphnate. $KC_8H_4N_6O_6 \cdot H_2O$.

Properties: Yellow prisms. Mp loses water at 120C.

Hazard: Explodes when shocked or heated.

Use: High explosive.

potassium sulfate.

CAS: 7778-80-5. K_2SO_4 .

Properties: Colorless or white, hard crystals or powder; bitter saline taste. D 2.66, mp 1,072C. Soluble in water; insoluble in alcohol.

Derivation: (1) By treatment of potassium chloride either with sulfuric acid or with sulfur dioxide, air, and water (Hargreaves process); (2) by fractional crystallization of a natural sulfate ore; (3) from salt-lake brines.

Grade: Highest purity medicinal, commercial, crude, CP, agricultural, reagent, technical.

Use: Reagent in analytical chemistry, medicine (cathartic), gypsum cements, fertilizer for chloride-sensitive crops such as tobacco and citrus, alum manufacture, glass manufacture, food additive.

potassium sulfhydrate. See potassium hydrosulfide.

potassium sulfide.

CAS: 1312-73-8. K_2S .

Properties: Red or yellow-red crystalline mass or fused solid. D 1.75 (20/4C), mp 910C. Deliquescent in air; soluble in water, alcohol, and glycerol; insoluble in ether.

Grade: Technical.

Hazard: Flammable, dangerous fire risk, may ignite spontaneously, explosive in form of dust or powder.

Use: Reagent in analytical chemistry, depilatory, medicine.

potassium sulfite.

CAS: 10117-38-1. $K_2SO_3 \cdot 2H_2O$.

Properties: White crystals or powder. Soluble in water; sparingly soluble in alcohol; decomposes on heating and slowly oxidizes in air.

Grade: Technical, CP, FCC.

Use: Photographic developer, medicine (cathartic), food and wine preservative.

potassium sulfocarbonate. (potassium tri-thiocarbonate). K_2CS_3 .

919

POTASSIUM THIOSULFATE

Properties: Yellowish-red crystals. Very hygroscopic; soluble in alcohol and water.

Grade: Technical.

Hazard: Toxic by ingestion, strong irritant.

Use: Analysis (testing for cobalt, nickel), medicine, soil fumigant.

potassium sulfocyanate. See potassium thiocyanate.

potassium sulfocyanide. See potassium thiocyanate.

potassium tantalum fluoride. See tantalum potassium fluoride.

potassium tartrate. $K_2C_4H_4O_6 \cdot 1/2H_2O$.

Properties: Colorless, crystalline solid. D 1.98. Soluble in water; insoluble in alcohol; decomposed by heat (200-220C).

Grade: CP, technical.

Use: Manufacture of potassium salts, medicine (cathartic), lab reagent.

potassium tellurite. K_2TeO_3 .

Properties: Granular, white powder. Hygroscopic; decomposes at 460-470C. Soluble in water.

Use: Analysis (testing for bacteria).

potassium tetrathiocyanodiammonochromate. See Reinecke salt.

potassium tetroxalate. $KHC_4O_6 \cdot H_2C_2O_4$.

Properties: White crystals. Soluble in water; slightly soluble in alcohol.

Use: Metal polish, spot removal, analytical chemistry.

potassium thiocyanate. (potassium rhodanide; potassium sulfocyanate; potassium sulfocyanide).

CAS: 333-20-0. KCNS.

Properties: Colorless, transparent, deliquescent crystals; odorless; saline cooling taste. D 1.88, mp 173C, turns brown, green, blue when fused, white again on cooling, bp decomposes at 500C. Soluble in water, alcohol, and acetone.

Derivation: By heating potassium cyanide with sulfur.

Grade: Commercial, pure, reagent, ACS.

Hazard: Toxic by ingestion.

Use: Reagent; manufacture of sulfocyanides, thioureas; printing and dyeing textiles; photographic restrainer and intensifier; synthetic dyestuffs; medicine (hypotensive).

potassium thiosulfate. (potassium hyposulfite).

CAS: 10294-66-3. $K_2S_2O_3$ (with varying proportions of water of crystallization).